

The Relationship of Cyberbullying on Adolescents' Self-esteem Level and Anxiety

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Abstract. Cyberbullying has a persistent impact on the mental health of adolescents, such as short-term emotional distress, and can lead to long-term psychological consequences. This study reviewed four core literature sources published over the past nine years, including meta-analyses, systematic reviews, and cross-cultural empirical studies, focusing on the two key psychological variables of self-esteem and anxiety, while also considering gender differences and cultural contexts. The literature findings consistently indicate that low self-esteem significantly increases the risk of adolescents suffering from cyberbullying, while high anxiety may either be a result of victimisation or already exist before the incident, thus increasing the risk of involvement. Methodological comparisons revealed differences between cross-sectional and longitudinal studies, as well as the impact of measurement tools and sample diversity on results. The findings emphasise the necessity of early psychological screening, targeted emotional regulation training, and culturally sensitive prevention strategies, providing evidence-based guidance for cyberbullying control at the school and communities.

Keywords: Adolescents, cyberbullying, self-esteem, anxiety, systematic review

1. Introduction

With the rapid development of the Internet and social media, cyberbullying has become an important public issue. Adolescents, who are still developing their self-esteem and emotional regulation, are very sensitive to outside influences. Cyberbullying affects immediate emotional states and has long-term effects on mental health, including increased anxiety risk. Existing research has shown various psychological factors related to cyberbullying, but there is still a need for comprehensive comparisons of variables, such as how self-esteem and anxiety in different cultural contexts interact between victims and perpetrators. This study reviews four core papers published in the past nine years, including meta-analyses, systematic reviews, and empirical studies from different countries. It compares cross-sectional and longitudinal results and critically evaluates measurement tools and cultural factors. Focusing on self-esteem and anxiety, and briefly discussing gender and cultural differences, this study identifies commonalities, methodological limitations, and differences, and provides evidence-based recommendations for early detection, targeted interventions, and culturally appropriate prevention strategies.

1.1. Definition of adolescence

To provide a consistent analytical framework, the key terms 'adolescents' and 'cyberbullying' are defined below. Adolescence refers to the stage between childhood to adulthood, traditionally defined as the age from 10 to 19. However, recent scholars have suggested extending this range to 10 to 24 years, based on evidence from physiology, psychology, and sociology. Many young people today remain in education into their twenties and have yet to fully transition into adult roles, while neurological development and social cognition also continue to evolve beyond age 20. According to Sawyer et al.'s study, this extended definition better reflects the realities of modern adolescent development [1]. Therefore, this paper defines adolescents as individuals aged 10 to 24.

1.2. Definition of cyberbullying

Cyberbullying is a harm via digital tools, using hostile language or actions to cause psychological and social harm [2]. Unlike traditional bullying, cyberbullying has different features such as stronger anonymity, rapid information spread, and long-term record retention. Common forms include sending harassing messages, engaging in online arguments, disclosing private information, excluding others, spreading false information, and tracking or threatening victims online. These behaviours often occur together, causing long-term fear and anxiety, and in severe cases leading adolescence to suicide. Moreover, cyberbullying can exist in various digital media, including messaging systems, email, social platforms, image sharing, and online games [3]. The variety of channels increases its diversity and secrecy, making detection and control more difficult.

2. Relationship between cyberbullying and self-esteem of adolescents

2.1. Overview of core studies

Adolescence is an important stage in the development of self-esteem. They are undergoing rapid physical and mental changes and are in a highly sensitive state. They are building the self-awareness through external feedback, especially from peers and society. With rapid digitalisation and the high use of social media, cyberbullying has become a dangerous threat to adolescence self-esteem. Research shows that cyberbullying affects both victims and perpetrators. This chapter analyses two core studies, supplemented by two cross-cultural comparisons, to better understand the relationship between cyberbullying and adolescent self-esteem, to identify potential research limitations.

2.2. Lei et al.'s meta-analysis

First, a 2020 meta-analysis by Lei et al., and it combined 61 articles on the relationship between adolescent self-esteem and cyberbullying, with a total sample of 49,406 students aged 5–24 worldwide [4]. This range covers adolescence, allowing the findings to reflect this developmental stage broadly. The researchers searched 13 English and Chinese databases for studies published between 2008 and 2018, applying strict inclusion criteria to ensure relevance and quality. Using Comprehensive Meta-Analysis 2.0 software and a random effects model, they found a significant negative correlation between self-esteem and cyberbullying ($\beta = -0.161$, $p < 0.001$), meaning lower self-esteem increases the possibility of adolescents' involvement in cyberbullying, whether as perpetrators or victims.

Meanwhile, the researchers found that although the data of all measures showed a negative correlation between self-esteem and cyberbullying, the data of Rosenberg Self-esteem Scale (RSES)

($r = -0.185$) were higher than those of other measures ($r = -0.101$). This suggests the choice of scale may affect conclusions. The study also analysed cultural background effects, finding the correlation strongest in Asian samples ($r = -0.218$) are weaker in American ($r = -0.134$) and European samples ($r = -0.147$). This shows cultural differences in addressing cyberbullying. Western societies tend to rely on institutional norms and laws, while Asian cultures often adopt strict repression, which may further spark online violence.

A similar trend emerged regarding age. The meta-analysis demonstrated that the negative relationship between self-esteem and cyberbullying became less pronounced with increasing age, potentially due to psychological development in adolescents [4]. Older adolescents tend to develop mature social values, regulate their emotions and behaviour better, and are less likely to engage in bullying due to fluctuations in self-esteem. In contrast, younger adolescents have a more unstable identity and are more susceptible to peer influence and external judgement, making them more likely to become targets or perpetrators of cyberbullying if they lack self-confidence or support. Notably, gender was not significantly related to participation in this study.

2.3. Agustiningsih et al.'s systematic review

Similarly, a 2023 systematic review by Agustiningsih et al. further confirmed the link between adolescent self-esteem and cyberbullying [5]. The study focused on English-language papers published after 2000, using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) as the standard, and selected matched cross-sectional studies from databases. Ultimately, 10 high-quality papers were chosen from 861 documents. The research subjects were mainly adolescents, with sample sizes generally ranging from 200 to 5,000, ensuring strong representation.

Most studies used validated instruments to measure the relationship between self-esteem and bullying behaviour, with the Rosenberg Self-Esteem Scale (RSES) being most common. Others included the Illinois Bully Scale, the Olweus Bullying Questionnaire, and the European Cyberbullying Intervention Project Questionnaire (ECIP-Q). Using these standardised tools, the review evaluated the impacts of cyberbullying on adolescents. After analysis, the study found a clearly negative relationship between self-esteem and victimisation, both online and offline. It is worth noting that findings on the relationship between violent behaviour and self-esteem were inconsistent. While some data suggested individuals with high self-esteem may show stronger aggression, overall results did not show a correlation.

Furthermore, this article also emphasises the influence of self-esteem on the development of adolescents' social skills. Agustiningsih et al. found that individuals with low self-esteem are more likely to become isolated, which also causes them to feel a lack of social belonging [5]. At the same time, they are more likely to be bullied, and the experience of bullying in turn weakens their self-esteem, creating a vicious cycle.

2.4. Cross-cultural supplementary studies

To supplement these findings, this paper draws on two empirical studies from local contexts. A survey of 607 students in Iquitos, Peru, found low self-esteem a key factor in bullying, with highly empathetic students more likely to be attacked [6]. A 2021 London study of 1,288 students aged 11–19 found traditional bullies often had low self-esteem and impulsivity, but cyberbullies, due to anonymity, may not share this trait [7].

2.5. Comparative analysis and finding

Based on the analysis of the four studies, all research shows a link between low self-esteem and victimisation risk but also notes that cyberbullying cannot be explained by a single variable. Motives may be shaped by multiple factors, such as cultural background and personality traits. Most studies have not found gender to be a significant moderator.

2.6. Limitations and future direction

However, the two core studies also have limitations. Although they cover wide topics and many samples, most selected articles are cross-sectional and cannot confirm causality. Definitions of 'self-esteem' or 'bullying' also vary slightly, affecting applicability. Some studies did not sufficiently control for external factors influencing self-esteem, such as family environment, mental health, or peer relationships, limiting generalisability. Future research could be strengthened through longer-term longitudinal tracking and more comprehensive consideration of confounding factors.

3. Relationship between cyberbullying and anxiety of adolescents

3.1. Overview of core studies

For the relationship between anxiety and cyberbullying among adolescents, research finds that anxiety is often triggered earlier than depression. Anxiety can play multiple roles in cyberbullying. Sometimes it is a direct result of being bullied, and other times it already exists before the bullying happens, making teens more likely to get involved in bullying. In some cases, it can even be a link between cyberbullying and other mental health issues.

This section selects one cross-sectional study and one longitudinal study for in-depth analysis, combined with three studies that differ in cultural backgrounds and age ranges, to compare the conclusions and methodological differences, thereby gaining a more comprehensive understanding of the relationship between cyberbullying and adolescent anxiety.

3.2. Pabian and Vandebosch et al.'s longitudinal study

3.2.1. Research object and method

In a longitudinal study, Pabian and Vandebosch used a sample of 2,128 Belgian adolescents aged 10-17 (56.6% girls) and collected self-report questionnaire data at two time points, with six months between them [8]. They analyzed the relationship between social anxiety and bullying behaviour using cross-lagged structural equation modeling in Mplus, using Maximum Likelihood Estimation with Robust Standard Errors (MLR estimation).

3.2.2. Measurement tools and finding

The results showed that social anxiety at the first time point significantly predicted the degree of cyberbullying victimisation six months later ($\beta = 0.06$, $p < 0.05$). This means that higher levels of social anxiety are an important risk factor for subsequent victimisation. Moreover, the experience of being victimised by cyberbullying did not significantly predict subsequent levels of social anxiety. In other words, higher levels of anxiety are more likely to exist before victimisation and increase the risk of victimisation to a certain extent.

At the same time, social anxiety at time point one cannot significantly predict subsequent violent behavior. It is worth noting that during the bullying process, cyberbullies did not show a significant increase in anxiety levels during follow-up visits. This result contrasts with the conclusion of some cross-sectional studies that bullies also have an emotional burden. The authors believe that this may be related to the anonymity and instant feedback mechanisms of the online environment. Anonymity enables criminals to hide their true identities, which can buffer feelings of guilt, shame or fear of revenge. These characteristics can protect cyberbullies from the direct emotional costs that are common in face-to-face bullying. Overall, this study demonstrates the role of social anxiety as a precursor to victimisation rather than a driving factor for violence. The literature also suggests that intervention measures should focus on providing support services to adolescents with high levels of social anxiety before bullying occurs, thereby reducing their risk of victimisation at the source.

3.3. Grigore and Maftei's cross-sectional study

3.3.1. Research object and method

Unlike the causal perspective found in longitudinal studies, Grigore and Maftei focused on analysing the mediating role of anxiety between cyberbullying and depression in a cross-sectional study conducted in Romania [9].

The study included 501 middle school students aged 12–15 years old.

3.3.2. Measurement tools and finding

Among them, 15% were classified as aggressors, 18.6% as victims, 30.5% as double role players, and 35.9% as non-cyber participants. The European Cyberbullying Intervention Project Questionnaire (ECIPQ) was used to measure violence and victimisation, the State-Trait Anxiety Inventory (STAI) was used to evaluate state anxiety and trait anxiety, and the updated Beck Depression Inventory (BDI-II) was used to measure depression levels. The results showed that both state anxiety and trait anxiety were significantly higher among victims than in other groups, and adolescents who were both perpetrators and victims also had higher anxiety levels.

At the same time, participants with lower state anxiety levels were less likely to be pure victims, and more likely to be perpetrators, double role players, or non-participants. In comparison, participants with lower trait anxiety levels were more likely to be perpetrators or non-participants. Therefore, combined analysis showed that state anxiety played a major mediating role in the process of cyberbullying leading to depression (victims $b = 0.82$, perpetrators $b = 0.39$), while trait anxiety had no significant mediating effect. This suggests that anxiety can be significantly influenced by experiences of cyberbullying, while the long-term effects of personality are relatively minor.

3.4. Cross-cultural supplementary studies

In other research, Baruah et al. surveyed 240 students aged 13–18 in Gujarat, India, and found a moderate positive relationship between cyberbullying and anxiety ($r = 0.536$) [10]. Adolescents involved in cyberbullying (whether as perpetrators, victims, or both) had significantly higher anxiety levels than those not involved ($z = 0.9802$). Doumas and Midgett provided a more unique research result, finding that even those who witnessed cyberbullying reported higher levels of social anxiety ($p < 0.01$), although they did not have experience of being victimised [11]. This suggests that the psychological impact of cyberbullying is not limited to direct victims; the emotional stress experienced by bystanders can also lead to anxiety.

Finally, Agustiningsih et al. conducted a systematic review of 25 relevant studies over the past five years, selected using predefined inclusion criteria to ensure sample relevance and methodological quality, and found that anxiety levels among victims and perpetrators of cyberbullying were generally higher than in traditional bullying, particularly with victims exhibiting higher levels of anxiety and depression, and women facing higher risks [12].

3.5. Comparative analysis and finding

In summary, the five studies mentioned above all share a common finding: there is a clear relationship between cyberbullying and adolescent anxiety, and this relationship is found in different cultures and same age groups. However, it should be noted that these studies have certain limitations. First, most of the research methods rely on self-report questionnaires, which may be influenced by social expectations or differences in self-perception. Second, the measurement tools and indicators for anxiety are not standardised. For example, some studies distinguish between state and trait anxiety, while others do not, which may introduce possible differences when comparing results. Nevertheless, the overall trend across all studies remains consistent.

4. Discussion and suggestion

4.1. The overall conclusion of the current research

From the perspectives of self-esteem and anxiety, existing research consistently shows that cyberbullying has a persistent and multifaceted impact on adolescents' mental health. Low self-esteem increases vulnerability to online attacks, while anxiety may arise as a reaction after victimisation or as a pre-existing condition that heightens the risk of being targeted. These two characteristics often interplay: lowered self-esteem may increase anxiety, and persistent anxiety may further weaken self-esteem. Research suggests these relationships vary across cultures, with Asian samples showing stronger associations, possibly due to sociocultural factors. Gender differences are not generally significant, but female victims are more likely to show higher anxiety. Despite differences in samples, methods, and measures, the trend is consistent: self-esteem and anxiety levels are key factors in adolescents' cyberbullying risk.

4.2. The suggestion based on the conclusion

Based on these findings, early identification and intervention are vital. Schools should set up regular psychological examinations, focusing on students with low self-esteem and high social anxiety, to identify at-risk students early and provide targeted emotional management and social skills training. Schools should also introduce cyber awareness education into curricula, covering online risk identification, self-protection strategies, and healthy interaction to build correct online behaviour. Finally, a long-term follow-up mechanism should manage high-risk students individually, ensuring intervention continuity and avoiding gaps in psychological support. This multi-system approach can reduce cyberbullying risk and promote mental health.

5. Conclusion

In conclusion, this review demonstrates that self-esteem and anxiety are two important factors for cyberbullying among adolescents. Across different methodologies and cultural contexts, research findings have consistently shown that low self-esteem increases the possibility of being attacked

online, while high anxiety may exist both before and after victimisation, affecting adolescents' mental health and impact their attitude towards bullying. The interactions between these factors can cause harm and increase vicious cycles. Cultural contexts further shape these relationships, resulting in inconsistent strengths observed across different settings.

Despite reliable evidence, most studies reviewed are cross-sectional, limiting the ability to infer causality. Differences in the definitions of self-esteem and bullying, as well as inconsistent control for external factors such as family environment or peer relationships, also affected generalisability. Future research should adopt longitudinal designs, integrate culturally sensitive frameworks, and consider confounding variables to gain deeper understanding. By consolidating existing evidence, this study highlights the necessity of early detection, targeted psychological support, and comprehensive cyber awareness education to reduce the risk of cyberbullying and promote healthier development among adolescents.

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